

# Aircraft Engine Life-Consumption Monitoring for Real-Time Reliability Determination, Phase I

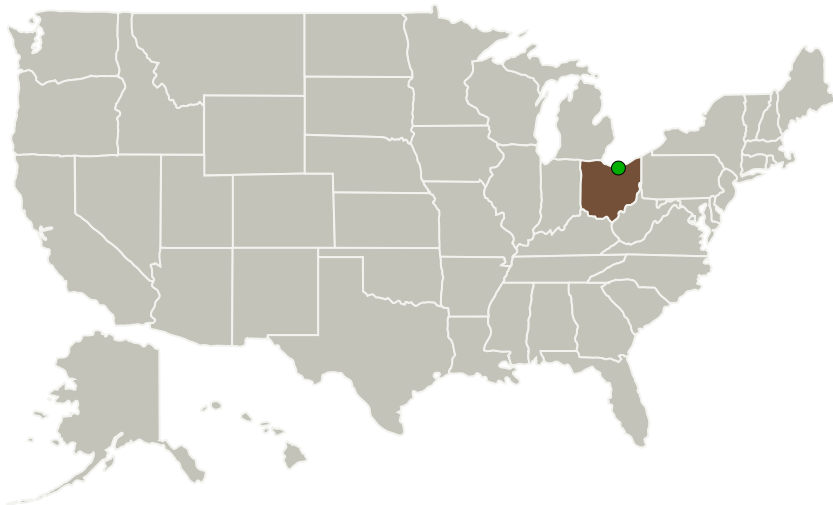
Completed Technology Project (2010 - 2010)



## Project Introduction

A real-time life-use consumption monitor is proposed for aircraft engine systems. The life monitor will process power data available on the aircraft to calculate the accumulating in-flight power loading which the engine experiences. This power loading reduces the available life of the engine. Under emergency in-flight conditions and/or foreign object damage, engine loads and temperatures can increase rapidly as a sign of decreased remaining engine life and reliability. The life monitor will calculate and display in the aircraft the remaining time for safe operation under these conditions. At present, fatigue life analysis techniques are primarily used as design-analysis tools. These techniques have not been adapted for in-service use with an aircraft to date. The reliable use of aircraft engines can be extended with more accurate knowledge of their remaining component and system fatigue lives. Early identification of engines in need of repair due to heavy use will improve their in-service safety. By developing a life monitoring system which can be associated with a specific engine system and have as input the loads and load durations of that system, the reliability and safety of that system can be improved.

## Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Nastec, Inc.	Lead Organization	Industry	Brook Park, Ohio
● Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

## Primary U.S. Work Locations

Ohio

## Project Transitions

**January 2010:** Project Start**July 2010:** Closed out**Closeout Documentation:**

- Final Summary Chart(<https://techport.nasa.gov/file/139923>)

## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Organization:**

Nastec, Inc.

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

**Principal Investigator:**

Richard Klein

**Co-Investigator:**

Richard Klein

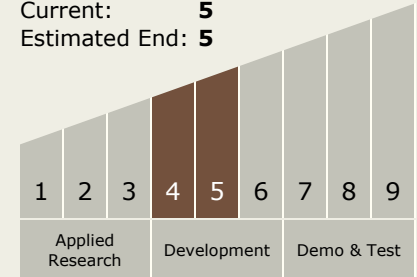
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## Technology Maturity (TRL)

Start: **4**  
Current: **5**  
Estimated End: **5**



## Technology Areas

### Primary:

- TX13 Ground, Test, and Surface Systems
  - └ TX13.2 Test and Qualification
    - └ TX13.2.6 Advanced Life-Cycle Testing Techniques

## Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System